AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the present application:

Claims 1-5 (Cancelled).

6. (Original) A method for producing an unsaturated carboxylic acid comprises contacting, in a reaction zone, a feed gas stream comprising an alkane with a catalyst system comprising a first catalyst component and a second catalyst component, said first catalyst component being capable of catalyzing the conversion of an alkane to a product comprising a corresponding product alkene and unreacted alkane, said second catalyst component being capable of catalyzing the conversion of an alkane to a product comprising a corresponding unsaturated carboxylic acid and being capable of catalyzing the conversion of an alkene to a product comprising a corresponding product unsaturated carboxylic acid, wherein said first catalyst component is different from said second catalyst component.

7. (Original) The method according to claim 6, wherein said first catalyst component and said second catalyst component are mixed together.

8. (Original) The method according to claim 7, wherein said first catalyst component comprises an orthovanadate and said second catalyst comprises a mixed metal oxide having the empirical formula

$$A_aM_bN_cX_dO_e$$

wherein

A is at least one element selected from the group consisting of Mo and W,

M is at least one element selected from the group consisting of V, Ce and Cr,

N is at least one element selected from the group consisting of Te, Bi, Sb and Se,

X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Mn, Fe, Ru, Co, Rh, Ni, Pt, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu; and

wherein

when $a = 1$, $b = 0.01$ to 1.0, $c = 0.01$ to 1.0, $d = 0.01$ to 1.0 and e is dependent on the oxidation state of the other elements.

9. (Original) The method according to claim 7, wherein said reaction zone has a longitudinal dimension which extends in a direction of flow of said feed gas stream and a relative proportion of said first catalyst component and said second catalyst component in said mixture of said first catalyst component and said second catalyst component varies along said longitudinal dimension in the direction of flow.

10. (Original) The method according to claim 9, wherein said reaction comprises at least two sub-zones, said sub-zones being disposed sequentially, at least two of said sub-zones containing different concentrations of said second catalyst component mixed with said first catalyst component, and wherein said feed stream gas passes through said sub-zones in sequential order.

11. (Original) The method according to claim 6, wherein said reaction zone comprises at least two sub-zones, said sub-zones being disposed sequentially, at least one of said sub-zones containing said first catalyst component and at least one different sub-zone containing said second catalyst component; wherein said feed gas stream passes through said sub-zones in sequential order.

12. (Original) The method according to claim 11, wherein the first of said at least two sub-zones containing different catalyst components in sequence contains said first catalyst component.

13. (Original) The method according to claim 6, wherein said second catalyst component is supported on said first catalyst component.

14. (Original) The method according to claim 13, wherein said reaction zone has a longitudinal dimension which extends in a direction of flow of said feed gas stream and a relative proportion of said second catalyst component supported on said first catalyst component varies along said longitudinal dimension in the direction of flow.

15. (Original) The method according to claim 13, wherein said reaction zone comprises at least two sub-zones, said sub-zones being disposed sequentially, at least two of said sub-zones containing different concentrations of said second catalyst component supported on said first catalyst component, and wherein said feed gas stream passes through said sub-zones in sequential order.

16. (Original) The method according to claim 15, wherein, of said at least two sub-zones containing different concentrations of said second catalyst component supported on said first catalyst component, the first of said at least two sub-zones containing different concentrations of said second catalyst component supported on said first catalyst component in the sequence has a lower concentration of said second catalyst component than the second of said at least two sub-zones containing different concentrations of said second catalyst component in the sequence.

17. (Original) The method according to claim 6, wherein said first catalyst component comprises an oxidative dehydrogenation catalyst.

18. (Original) The method according to claim 6, wherein said second catalyst comprises a mixed metal oxide having the empirical formula

$$A_aM_bN_cX_dO_e$$

wherein

A is at least one element selected from the group consisting of Mo and W,
M is at least one element selected from the group consisting of V, Ce and Cr,
N is at least one element selected from the group consisting of Te, Bi, Sb and Se,

X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Mn, Fe, Ru, Co, Rh, Ni, Pt, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu; and

wherein

when a = 1, b = 0.01 to 1.0, c = 0.01 to 1.0, d = 0.01 to 1.0 and e is dependent on the oxidation state of the other elements.

19. (Original) A method for producing an unsaturated carboxylic acid comprises;

contacting, in a reaction zone, a feed gas stream comprising an alkane with a catalyst system capable of catalyzing the conversion of an alkane to a product comprising a product corresponding unsaturated carboxylic acid, a product corresponding alkene and unreacted alkane and being capable of catalyzing the conversion of an alkene to a product comprising a product corresponding unsaturated carboxylic acid;

wherein said reaction zone comprises at least two sub-zones, said sub-zones being disposed sequentially,

at least one of said sub-zones being maintained at reaction conditions most favorable to the production of said product corresponding alkene, and

at least one other sub-zone being maintained at reaction conditions most favorable to the production of said product corresponding unsaturated carboxylic acid; and

wherein said feed gas stream passes through said sub-zones in sequential order.

20. (Original) The method according to claim 19, wherein at least one sub-zone being maintained at reaction conditions most favorable to the production of said product corresponding alkene precedes at least one sub-zone being maintained at reaction conditions most favorable to the production of said product corresponding unsaturated carboxylic acid.

21. (Original) The method according to claim 19, wherein said catalyst system comprises a mixed metal oxide having the empirical formula

$$A_aM_bN_cX_dO_e$$

wherein

A is at least one element selected from the group consisting of Mo and W,

M is at least one element selected from the group consisting of V, Ce and Cr,

N is at least one element selected from the group consisting of Te, Bi, Sb and Se,

X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Mn, Fe, Ru, Co, Rh, Ni, Pt, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu; and

wherein

when $a = 1$, $b = 0.01$ to 1.0, $c = 0.01$ to 1.0, $d = 0.01$ to 1.0 and e is dependent on the oxidation state of the other elements.

22. (Original) A method for producing an unsaturated nitrile comprises:

contacting, in a reaction zone, a feed gas stream comprising an alkane with a catalyst system comprising a first catalyst component and a second catalyst component, wherein said first catalyst component and said second catalyst component may be the same or different, said first catalyst component being capable of catalyzing the conversion of an alkane to a product comprising a corresponding product alkene and unreacted alkane, said second catalyst component being capable of catalyzing, in the presence of ammonia, the conversion of an alkane to a product comprising a corresponding product unsaturated nitrile and being capable of catalyzing, in the presence of ammonia, the conversion of an alkene to a product comprising a corresponding product unsaturated nitrile;

wherein said reaction zone comprises at least two sub-zones, said sub-zones being disposed sequentially, at least one of said sub-zones containing said first catalyst component and at least one different sub-zone containing said second catalyst component, said feed gas stream passing through said sub-zones in sequential order; and

wherein ammonia is only fed to said at least one different sub-zone containing said second catalyst component.

23. (Original) The method according to claim 22, wherein said first catalyst component is different from said second catalyst component.

24. (Original) The method according to claim 23, wherein the first of said at least two sub-zones containing different catalyst components in sequence contains said first catalyst component.

25. (Original) The method according to claim 23, wherein said first catalyst component comprises an oxidative dehydrogenation catalyst.

26. (Original) The method according to claim 23, wherein said second catalyst component comprises a mixed metal oxide having the empirical formula

$$A_aM_bN_cX_dO_e$$

wherein

A is at least one element selected from the group consisting of Mo and W,

M is at least one element selected from the group consisting of V, Ce and Cr,

N is at least one element selected from the group consisting of Te, Bi, Sb and Se,

X is at least one element selected from the group consisting of Nb, Ta, Ti, Al, Zr, Mn, Fe, Ru, Co, Rh, Ni, Pt, B, In, As, Ge, Sn, Li, Na, K, Rb, Cs, Fr, Be, Mg, Ca, Sr, Ba, Hf, Pb, P, Pm, Eu, Gd, Dy, Ho, Er, Tm, Yb and Lu; and

wherein

when a = 1, b = 0.01 to 1.0, c = 0.01 to 1.0, d = 0.01 to 1.0 and e is dependent on the oxidation state of the other elements.

INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 C.F.R. §§ 1.97 and 1.98 and MPEP §§ 609 I.A.2. and 609 D., Applicants hereby submit the attached Form PTO-1449, in duplicate, which lists thereon all of the documents officially cited to the United States Patent Trademark Office and officially made of record in connection with Applicants' co-pending parent application, U.S. Serial No. 09/307,780, filed December 2, 2002. Pursuant to MPEP § §§ 609 I.A.2. and 609 D., since the present application is a divisional of parent application U.S. Serial No. 09/307,780 and all of the documents listed on the attached Form PTO-1449 were officially considered and made of record in the parent application, it is believed that the attached Form PTO-1449 is sufficient to enable the Examiner in charge of the present divisional application to consider and make officially of record all of the documents listed thereon. Thus, no copies of any of the documents listed on the attached Form PTO-1449 are being submitted to the United States Patent and Trademark Office.

The filing of this Information Disclosure Statement shall not be construed to mean that a search has been made, nor that no other material information, as defined in 37 C.F.R. § 1.56(a), exists. Furthermore, inclusion of a document on the attached Form PTO-1449 is <u>not</u> intended to constitute an admission that any document so disclosed is "prior art" with respect to the present invention unless specifically so stated herein.

In the foregoing circumstances, it is respectfully requested that each of the documents listed on the attached Form PTO-1449 be officially made of record in the present divisional application and printed on the face of any patent which issues therefrom.